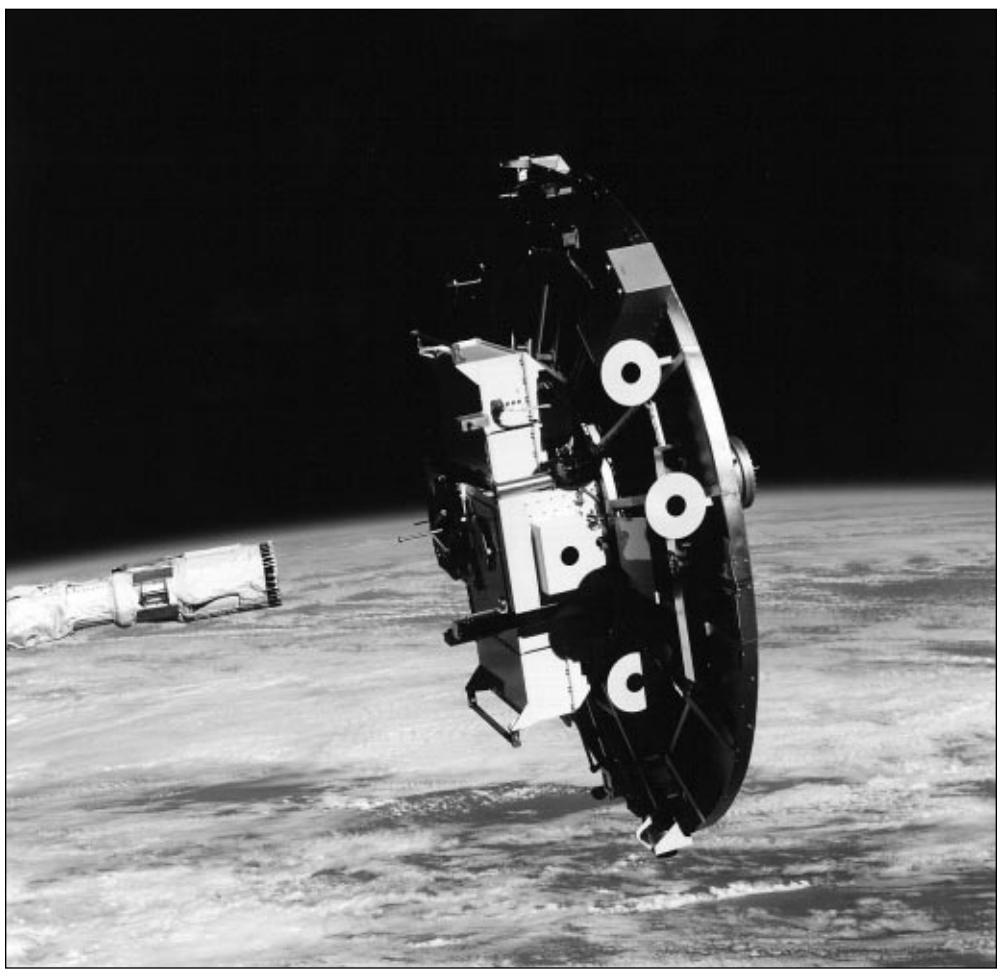
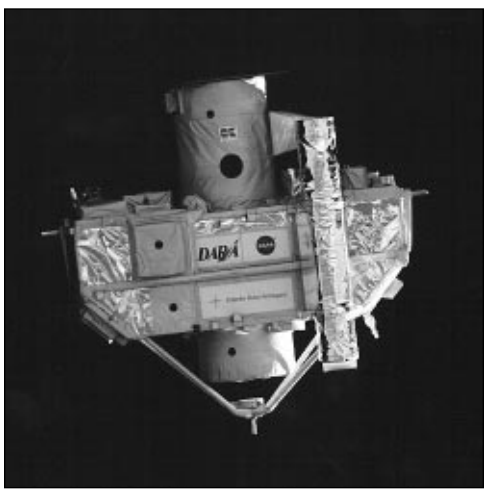
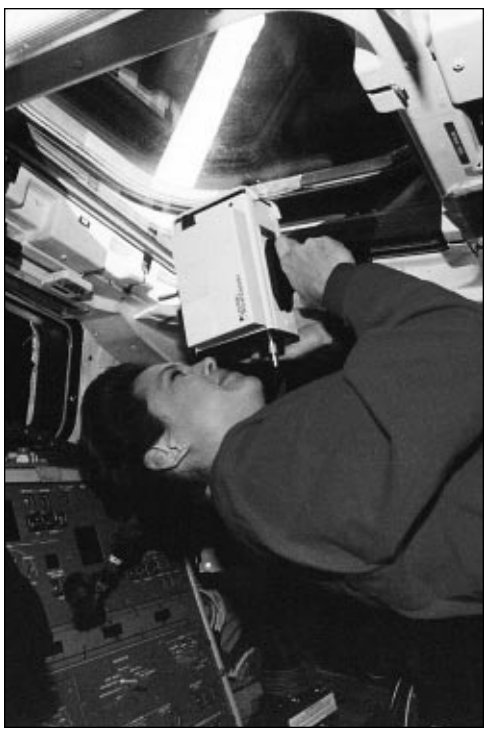


3-Body Solution

STS-80 mission enters history books as longest flight, first to deploy, retrieve two satellites





The STS-80 mission enters the record books as the longest shuttle flight and the first to deploy and retrieve two satellites,solving the 3-body orbital mechanics problem.

With a touchdown at 5:49 a.m. CST Dec. 7, STS-80 enters the record books as the longest shuttle flight in history. *Columbia*'s 17 day, 15 hour and 53 minute flight surpassed the previous record set by STS-78 in July.

STS-80 also was the first flight to deploy and retrieve two satellites. Commander Ken Cockrell, Pilot Kent Rominger and Mission Specialists Tammy Jernigan, Tom Jones and Story Musgrave successfully deployed and retrieved both the ORFEUS-SPAS and Wake Shield Facility satellites, bringing scientists more data than expected.

Mission managers gave astronomers an extra day to collect data from the ultraviolet astronomy satellite before the crew plucked ORFEUS-SPAS from its orbit and placed it back in *Columbia*'s cargo bay. Wake Shield scientists reported the maximum seven thin film growths of semiconductor material were completed during the three days the satellite flew free of *Columbia* surpassing its major objectives for the mission. The materials were grown in an ultravacuum 100 to 1,000 better than any seen on Earth. The satellite also was perched atop *Columbia*'s robot arm for about six hours as scientists gathered data on using atomic oxygen in low orbit to grow aluminum oxide films.

Through it all the crew collected photos to share. From top to bottom, left to right;

1) Jones uses the controls of *Columbia*'s Remote Manipulator System to conduct a test with the captured Wake Shield Facility, seen through window;

2) Cockrell steers *Columbia* from the aft flight deck during rendezvous operations with the Wake Shield Facility;

3) The Orbiting Retrievable Far and Extreme Ultraviolet Spectrometer-Shuttle Pallet Satellite, or ORFEUS-SPAS, appears suspended in space during approach by *Columbia*;

4) Jernigan uses a laser ranging device during *Columbia*'s rendezvous operations with the ORFEUS-SPAS;

5) The STS-80 crew captures on film the release of the Wake Shield Facility.

6) Using the Remote Manipulator System, the crew berths the Wake Shield Facility;

7) Rominger occupies the commander's station aboard *Columbia* during station keeping operations with ORFEUS-SPAS. Earth, some 190 nautical miles away, appears just beyond arm's length on *Columbia* port side;

8) Musgrave works with a pair of computers dedicated to Wake Shield Facility operations onboard *Columbia*'s flight deck. ❑